

Essential Species

Many different species fulfil important and irreplaceable roles in their ecosystem, often called a 'niche'. Other creatures completely alter their environment for the benefit of other animals, and are termed 'ecosystem engineers'. But what are these species, and how are they important? Here we outline the top 5 most essential species to life on Earth.

1. Bees

Once upon a time, it was said that if bees were to disappear off the face of the Earth tomorrow, man would have only 4 more years left to live. Although scientists no longer believe the outlook is so grave, bees are certainly one of the most important species on the planet. Bees pollinate our food. They provide us with the majority of the fruit in our diet, and as such are vital to the agricultural economy. One single hive of around 50,000 bees can pollinate up to half a million plants in just one day. Around 80% of American crops are said to be totally dependent on pollination by bees, and the picture is similar worldwide. Even where bees don't directly pollinate a species, often that species benefits by existing in a habitat where bees are at work, so these insects are helping to sustain biodiversity in their communities. Without them, plants on Earth wouldn't look half as colourful or be half as diverse. Plants and bees have co-evolved over thousands of years. If these creatures didn't exist humans might have to do the job of pollination. But dusting thousands and thousands of plants with pollen every day is no mean feat of labour.

2. Earthworms

These often-forgotten creatures are Kings of the soil. Earthworms construct burrows in the earth, which act as air spaces allowing oxygen and water to enter. This is key to the survival of other soil-dwelling invertebrates and is important for plant roots. Even just the presence of earthworms in a habitat improves biodiversity. Where there are lots of earthworms, bacteria and fungi follow. Although this might sound like a bad thing, these organisms help to breakdown nutrients and make them available to plants. Earthworms act as nature's ploughs, mixing up the layers to spread nutrients, improving overall soil fertility. Even their faeces are important, as it helps to give the soil a good crumb-like structure.

3. Bats

Like bees, bats are pollinators of an estimated 500 plant species. However, bats often visit less colourful flowers, and as such fulfil a different but nonetheless significant niche. Bats are also natural pest controllers, with insects being the main dietary component for many species. This is good for humans, as they limit the number of blood-sucking mosquitoes; and also for the environment, as they lessen the need for harmful pesticides to be used on crops, which would otherwise negatively impact on biodiversity. Fruit-eating bats help to disperse plant and tree seeds, by consuming and then excreting the seeds far away from the source. They therefore help to expand the area over which these species grow. The seeds are encased in their faeces, which is nutrient rich and acts as a fertiliser for germination. Bats often aid regeneration of forests as a result of this dispersal.

4. Dung Beetles

Not to be sniffed at, these creatures are literally the toilet cleaners of the animal world. Vital and yet underappreciated, both the adults and their larvae feed on the faeces of large herbivores, helping to break down the dung and recycle the nutrients back into the soil. This process helps to enhance the structure of soil and improve its fertility. The job that dung beetles do helps to also clean up agricultural land. By removing feces they reduce the number of breeding sites for insect pests, and this helps to control levels of disease in livestock.

5. Beavers

A lumberjack of sorts, the beaver is nature's most famous ecosystem engineer. This animal is adept at gnawing away at tree trunks until they topple and create dams. These dams are incredibly important for wildlife as they create new wetland habitats. By slowing down water flow, ponds and lakes are created, leading to higher water tables that can sometimes help to contain forest fires. In addition, the slow moving water allows silt to settle out, purifying the water and improving its quality so that other sensitive species can exist there.

Upon reviewing the information on the species above, answer the following:

1. Rank these species in order of importance, and justify your ranks.
2. For ONE species, develop a scenario in which something (synthesize on your own!) causes the species to go extinct. Describe some likely impacts on the local and global environment.